

1017

Cardiac MR Derived Septal Curvature is Correlated With Clinical Outcomes in Bronchopulmonary Dysplasia Associated Pulmonary Hypertension.

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Purpose: Determine if MR derived septal curvature correlated with respiratory outcomes and need for pulmonary vasodilator therapy in neonatal bronchopulmonary dysplasia.

Background: BPD is associated with pulmonary hypertension (PH); patients with BPD-associated PH (BPD-PH) have increased morbidity and mortality. MRI is used in the assessment of respiratory and cardiac disease in infants with BPD. Indirect MRI indices of RV pressure including left ventricular eccentricity index (MR-EI) correlate with clinical outcomes. In adults and older pediatric patients, decreased MRI septal curvature correlates with increased mean pulmonary artery pressure and pulmonary vascular resistance. The current study sought to determine the relationship of septal curvature in neonates with BPD and BPD-PH with short term respiratory outcomes and need for pulmonary vasodilator therapies.

Methods: 35 moderate or severe BPD and 11 mild BPD or control infants were imaged between 38 and 47 weeks post-menstrual age on a neonatal-sized, NICU-sited 1.5T MRI scanner. MR indices including septal curvature were determined and compared to BPD severity and clinical outcomes including hospital length of stay (LOS), duration of respiratory support, and pulmonary vasodilator therapy.

Results: Septal curvature was inversely associated with BPD severity ($p = 0.0184$). In a univariate analysis, septal curvature was associated with increased hospital LOS, duration of respiratory support, respiratory support at hospital discharge, and need for pulmonary vasodilator therapy. In multivariable analysis, BPD severity and septal curvature were associated with respiratory support at hospital discharge and septal curvature was associated with need for pulmonary vasodilator therapy.

Conclusions: MRI-derived septal curvature correlates significantly with clinical outcomes including hospital LOS, duration of respiratory support, and pulmonary vasodilator therapy in neonates with BPD.



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